

JC14 Rec'd PCT/PTO 03 DEC 2001

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		
INTERNATIONAL APPLICATION NO. PCT/EP00/05133	INTERNATIONAL FILING DATE June 6, 2000	PRIORITY DATE CLAIMED June 11, 1999
TITLE OF INVENTION DEVICE FOR CONTROLLING AN ENGINE		
APPLICANT(S) FOR DO/EO/US JORG HENLE		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). </p> <p>6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ul style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. </p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input checked="" type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>		
Items 11. to 16. below concern document(s) or information included:		
<p>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input type="checkbox"/> Other items or information:</p>		

page 1 of 2

EXPRESS MAIL #EL398538510US

(January 1995)

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on 12-3-01

(Date of Deposit)

Janice T. Staton

Name and Reg. No.

Signature

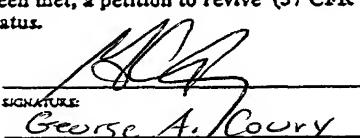
12/3/01

Date of Signature

US

Annex US.II, page 2

PCT Applicant's Guide - Volume II - National Chapter - US

U.S. APPLICATION NO. (Insert, see 37 C.F.R. 1.5)		INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER																																																
10/009006		PCT/EP00/01533	01-702																																																
<p>17. <input checked="" type="checkbox"/> The following fees are submitted:</p> <p>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO..... \$890.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) \$660.00</p> <p>No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).. \$730.00</p> <p>Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$1040.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$92.00</p>																																																			
ENTER APPROPRIATE BASIC FEE AMOUNT = \$ 890.00																																																			
<p>Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CLAIMS</th> <th>NUMBER FILED</th> <th>NUMBER EXTRA</th> <th>RATE</th> </tr> </thead> <tbody> <tr> <td>Total claims</td> <td>14</td> <td>-20 -</td> <td>0 X \$18 \$ 0</td> </tr> <tr> <td>Independent claims</td> <td>4</td> <td>-3 -</td> <td>1 X \$84 \$ 84</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$270 \$</td> </tr> <tr> <td colspan="3">TOTAL OF ABOVE CALCULATIONS</td> <td>= \$ 974.00</td> </tr> <tr> <td colspan="3">Reduction by 1/2 for filing by small entity, if applicable.</td> <td>\$ 487.00</td> </tr> <tr> <td colspan="3">SUBTOTAL = \$ 487.00</td> <td></td> </tr> <tr> <td colspan="3">Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).</td> <td>+ \$</td> </tr> <tr> <td colspan="3">TOTAL NATIONAL FEE = \$ 487.00</td> <td></td> </tr> <tr> <td colspan="3">Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property</td> <td>+ \$ 40.00</td> </tr> <tr> <td colspan="3">TOTAL FEES ENCLOSED = \$ 527.00</td> <td></td> </tr> <tr> <td colspan="3"></td> <td>Amount to be: refunded \$ charged \$</td> </tr> </tbody> </table>				CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	Total claims	14	-20 -	0 X \$18 \$ 0	Independent claims	4	-3 -	1 X \$84 \$ 84	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270 \$	TOTAL OF ABOVE CALCULATIONS			= \$ 974.00	Reduction by 1/2 for filing by small entity, if applicable.			\$ 487.00	SUBTOTAL = \$ 487.00				Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).			+ \$	TOTAL NATIONAL FEE = \$ 487.00				Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property			+ \$ 40.00	TOTAL FEES ENCLOSED = \$ 527.00							Amount to be: refunded \$ charged \$
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<p>a. <input checked="" type="checkbox"/> A check in the amount of \$ 527.00 to cover the above fees is enclosed.</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-0184. A duplicate copy of this sheet is enclosed.</p>																																																			
<p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p>																																																			
<p>SEND ALL CORRESPONDENCE TO:</p> <p>GEORGE A. COURY BACHMAN & LAPONTE, P.C. 900 CHAPEL STREET, SUITE 1201 NEW HAVEN, CT 06510-2802</p>																																																			
 <p>SIGNATURE George A. Coury NAME 34,309 REGISTRATION NUMBER</p>																																																			

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: JORG HENLE Docket No.: 01-702
Serial No.: Examiner :
Filed : Art Unit :
PCT No. : PCT/EP00/05133
IFD : June 6, 2000
For : DEVICE FOR CONTROLLING
AN ENGINE

900 Chapel Street
Suite 1201
New Haven, CT 06510-2802

PRELIMINARY AMENDMENT

Hon. Commissioner of Patent & Trademark
United States Patent & Trademark Office
Washington, DC 20231

Dear Sir:

In the above-identified application for United States patent,
please amend as follows:

IN THE SPECIFICATION

Attached please find a clean copy of the following:

- page 1, after the title and before the first paragraph,
insert as a heading --BACKGROUND OF THE INVENTION--.
- page 2, before the first paragraph, insert as a heading,
--SUMMARY OF THE INVENTION--.
- page 3, before the first paragraph, insert as a heading,
--BRIEF DESCRIPTION OF THE DRAWINGS--.
- page 3, after paragraph 6, insert as a heading --DETAILED
DESCRIPTION--.

- a marked up copy of the above-mentioned paragraphs
showing the amendments to said paragraphs.

IN THE CLAIMS

Attached hereto are claim amendments for claims 6-9 and 11-14, as well as a clean copy of these claims as amended.

IN THE ABSTRACT

Attached hereto is an ABSTRACT on a separate page.

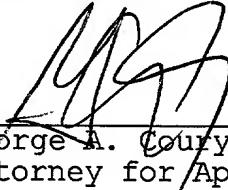
R E M A R K S

Headings have been added to the specification and amendments have been made to the claims to remove the multiple dependencies in order to conform with U.S. practice. An early action on the merits is respectfully requested.

Respectfully submitted

JORGE HENLE

By


George A. Coury
Attorney for Applicant

Area Code - 203
Telephone - 777-6628
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Date: December 3, 2001

express mail #EL398538510US

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12-3-01

on

Janice T. Staton

Name and Reg. No. *[Signature]*

Signature

12/3/01

Date of Signature

CLEAN COPY OF AMENDED SPECIFICATION

Page 1, after the title, before the first paragraph:

Arrangement for controlling an engine

BACKGROUND OF THE INVENTION

The present invention relates to an arrangement for controlling an engine, in particular of an aircraft, having at least one gas lever and a regulating device for the additional automatic driving of the gas lever.

Page 2, before first paragraph:

SUMMARY OF THE INVENTION

This object is achieved by virtue of the fact that a movement of the gas lever can be transmitted permanently, directly or indirectly, to a displacement measuring system and the gas lever is seated so as to be mounted in a linearly movable manner via a guide bush of a rotatable spindle, the spindle being designed as a non-self-locking trapezoidal screw spindle having a large pitch.

Page 3, before the first paragraph:

BRIEF DESCRIPTION OF DRAWINGS

Further advantages, features and details of the invention follow from the description below of preferred

exemplary embodiments and with reference to the drawings,
in which:

Page 3, between paragraphs 6 and 7:

figure 5 shows a schematic plan view of a further exemplary embodiment of the arrangement according to figures 1 to 4.

DETAILED DESCRIPTION

According to figure 1, an arrangement R_1 according to the invention for controlling an engine (not shown here), in particular of an aircraft, has a housing 1 in which a spindle 2 is mounted in a rotatable manner, preferably in the longitudinal direction of the housing 1. A displacement measuring system 3.1 sits on one end of the spindle 2 and a drive disk 4 sits on the other end.

CLEAN VERSION OF AMENDED CLAIMS

Patent claims

6. The arrangement as claimed in claim 1, characterized in that the spindle (2) is mounted so as to be rotatable in accordance with the movement of the guide bush (5) by a linear movement of the gas lever (6).

7. The arrangement as claimed in claim 1, characterized in that the displacement measuring system (3.1) is arranged on one end of the spindle (2).

8. The arrangement as claimed in claim 1, characterized in that the regulating device (9), as regulating motor having, if need be, an associated displacement measuring system (3.2), acts directly or indirectly on the other end of the spindle (2).

9. The arrangement as claimed in claim 1, characterized in that a drive disk (4) is arranged on one end of the spindle (2).

11. The arrangement as claimed in claim 1, characterized in that the gas lever (6) is guided linearly in a guide slot (7) of the housing (1), this guide slot (7) being arranged approximately parallel to the spindle (2).

12. The arrangement as claimed in claim 1,
characterized in that the gas lever (6) is connected
directly or indirectly to a guide element (10) which runs
approximately parallel to the spindle (2).

13. The arrangement as claimed in claim 1,
characterized in that the displacement measuring system
(3.1, 3.2), as a displacement transducer, is of an
inductive, magnetic or optical type.

14. The arrangement as claimed in claim 1,
characterized in that the displacement measuring system
(3.1, 3.2) and/or the force sensor (13) and/or the
regulating device (9) is connected to a control (14) in
order to assist a manual movement of the gas lever (6) by
connecting the regulating device (9) to load, it being
possible for the respective positions of the gas lever (6)
to be transmitted via the displacement measuring systems
(3.1, 3.2) to the engine in accordance with the operating
state.

Arrangement for controlling an engine

The present invention relates to an arrangement for controlling an engine, in particular of an aircraft, having at least one gas lever and a regulating device for the additional automatic driving of the gas lever.

Such arrangements are known and are common on the market in a wide variety of forms and designs. They serve in particular to control and start up an engine, for example of an aircraft.

A disadvantage with such conventional arrangements is that they do not provide sufficient safety if, for example during operation with an autopilot, the electric circuit or even the regulating motor fails.

It is then often disadvantageous that the pilot is not able to recognize the actual situation and position of the gas lever or the operating state of the engine.

This may have considerable undesirable consequences, in particular it may even result in aircraft crashing.

GB 2 114 717 A discloses a control arrangement for the active driving of, for example, a gas lever for controlling aircraft engines. In this case, the gas lever is in engagement with a spindle which has a small pitch and is designed to be self-locking. The gas lever can be driven only in an active manner via a drive motor which is connected directly or indirectly to the spindle. A disadvantage with this is that, if the electrical power fails, the spindle, in particular the gas lever, cannot be moved or driven manually.

US 4,494,061 describes a control device for an aircraft, a gas lever being movable in an active manner via motors in order to indicate the current operating state of an engine.

The object of the present invention is to provide an arrangement of the type mentioned at the beginning in which an engine can be permanently controlled manually and/or automatically in a simple, reliable and cost-effective manner.

This object is achieved by virtue of the fact that a movement of the gas lever can be transmitted permanently, directly or indirectly, to a displacement measuring system and the gas lever is seated so as to be mounted in a linearly movable manner via a guide bush of a rotatable spindle, the spindle being designed as a non-self-locking trapezoidal screw spindle having a large pitch.

In the present invention, the gas lever sits on a spindle which can be driven via a regulating motor for operation by means of autopilot. The pilot then recognizes the current state, in particular the operating state, of the engine in every situation and position.

If, for example, this regulating motor fails, he can manually actuate the gas lever. A spindle, on whose end a displacement measuring system sits, rotates due to the actuation of the gas lever. This displacement measuring system then transmits the corresponding information directly or indirectly via a computer to the engine. The movement of the gas lever is then independent of the regulating motor.

Within the scope of the invention in this case, it is also intended to use other displacement measuring systems which, for example, are suitable for detecting a rotary movement or a linear movement of the gas lever and for converting said rotary movement or linear movement into a signal.

In this case, the displacement measuring system may be of an inductive, magnetic and/or optical type. There is no limit to the invention in this respect.

Furthermore, it is important in the case of the present invention that the gas lever is guided linearly in a guide slot or along a guide element in order to produce a rotary movement with the spindle by means of the guide bush which is in engagement with the spindle. This rotary movement of the spindle is then transmitted to the displacement measuring system.

It has proved to be especially advantageous to use a spindle as a trapezoidal screw spindle which has a large pitch. This ensures absolute safety against self-locking during the manual and/or electrical movement of the guide bush, in particular of the gas lever in the guide slot. Furthermore, such trapezoidal screw

spindles have high rigidity and no tilting moments. They are suitable for linear precision guidance. In addition, a complex type of construction in a very narrow space is ensured and can be produced very cost-effectively.

Furthermore, it is advantageous in the case of the present invention that, without electrical power, the spindle can be set in rotation by purely manual movement of the gas lever in a linear direction, this rotation of the spindle being transmitted directly to the displacement measuring system. The latter then supplies the corresponding signals for controlling the engine.

As a result, the safety for controlling and starting up an engine is additionally increased.

Further advantages, features and details of the invention follow from the description below of preferred exemplary embodiments and with reference to the drawing, in which:

figure 1 shows a schematic perspective view of an arrangement for controlling an engine;

figure 2 shows a schematic plan view of a further arrangement for controlling an engine;

figure 3 shows a schematic plan view of a further exemplary embodiment of the arrangement for controlling an engine according to figures 1 and 2;

figure 4 shows a schematic plan view of a further exemplary embodiment of the arrangement according to figures 1 to 3;

figure 5 shows a schematic plan view of a further exemplary embodiment of the arrangement according to figures 1 to 4. (4)

According to figure 1, an arrangement R_1 according to the invention for controlling an engine (not shown here), in particular of an aircraft, has a housing 1 in which a spindle 2 is mounted in a rotatable manner, preferably in the longitudinal direction of the housing 1. A displacement measuring system 3.1 sits on one end of the spindle 2 and a drive disk 4 sits on the other end.

Sitting on the spindle 2 is a guide bush 5, which is in engagement with the spindle 2.

Adjoining the guide bush 5 is a gas lever 6. The latter is linearly guided in a guide slot 7 in the housing 1. The guide slot 7 is arranged approximately parallel to the spindle 2 in the housing 1 of the arrangement R_1 .

Adjoining the drive disk 4 via a drive gear 8 is a regulating motor 9 of a regulating device which transmits a rotary movement to the spindle 2. The gas lever 6 is moved back and forth in a linear manner along the guide slot 7 by the rotary movement of the spindle 2.

Assigned to the regulating motor 9 or the regulating device is a further displacement measuring system 3.2 which is connected to a control 14 via a connecting line (not designated).

In this way, the actual position and of the actual operating state of the engine can be inferred exactly via the position of the regulating device or the regulating motor 9.

To assist the drive movement of the spindle 2 and in particular the linear movement during manual actuation of the gas lever 6, a force sensor 13 is assigned to the gas lever 6 and/or the guide bush 5.

If the gas lever 6 is accordingly moved with a force F as shown in the direction of the double arrow, the regulating device 9 is connected to load and actuates the spindle 2, so that a movement and an automatically guided movement of the gas lever 6 is possible.

The pilot does not have to set the spindle 2 in corresponding rotation manually by his own force under any circumstances in order to change an operating state of an adjoining engine.

The functioning of the present invention is as follows:

If an aircraft is operated, for example, by means of an autopilot, the gas lever 6 is moved along by means of the regulating motor 9 in accordance with the control of the aircraft, so that the pilot, in every situation, recognizes the operating state of an engine from the position of the gas lever 6 in the guide slot 7.

At the same time, in the case of manual operation, an operating state is transmitted to a computer (not shown here) of the aircraft either via the regulating motor 9 and/or via the displacement measuring system 3.1, 3.2., this computer then controlling the corresponding engine.

It is especially advantageous in the case of the present invention that the gas lever 6 can be actuated manually, for example if the regulating motor 9 fails, and that the

pilot recognizes the operating state of the engine on the basis of the spindle-mounted position of the gas lever 6.

He can manually shift the gas lever 6 in a purely mechanical manner, as a result of which the spindle 2 rotates. This rotary movement is determined in the displacement measuring system 3.1, 3.2 and is transmitted to the corresponding computer for controlling the engine.

It is therefore also still possible, for example in the event of a power failure, to transmit the electrical signal from the displacement measuring system 3.1, 3.2 to the engine. This is of fundamental importance in the case of the present invention, since the safety of the aircraft is considerably increased with a corresponding arrangement for operating an engine.

In the event of an electrical failure of the system, no self-locking occurs. The gas lever 6 can be moved manually by hand, in which case the original position and setting of the operating state of the engine can be seen in every situation.

Self-locking is ruled out because the spindle 2 is designed as a trapezoidal screw spindle having a high pitch. Furthermore, this trapezoidal screw spindle has high rigidity, in particular high flexural and torsional rigidity. It permits no torsional flexure or tilting moments. It can therefore be manually rotated very precisely by the linear movement of the gas lever 6 via the guide bush 5 without any risk of self-locking in order to transmit the electrical signal for controlling the engine to the displacement measuring systems 3.1, 3.2 directly or indirectly by a manual movement.

The control 14 at least partly takes over the guided movement of the gas lever 6 or the guide bush 5 if, for example, the force sensor 13 is actuated. The regulating motor 9 is then accordingly connected to load in order to electrically assist the manual movement of the gas lever 6. The control 14 may be an external component of the housing 1 or of the regulating device 9. This is to be included by the present idea of the invention.

In the exemplary embodiment of the present invention according to figure 2, an arrangement R_2 is shown in which, in the manner described above, the spindle 2 is arranged so as to be mounted in a rotatable manner in the housing 1, the displacement measuring system 3.1, 3.2 for measuring the rotations of the spindle 2 being arranged at one end, and the drive disk 4 being arranged at the other end. The drive disk 4 is controlled in the manner described above via the drive gear 8 by means of the regulating motor 9 having the displacement measuring system 3.2, for example during operation by means of the autopilot. The force sensor 13, which, as described above, is connected to the control 14, is assigned to the gas lever 6 and/or the guide bush 5.

A difference from the exemplary embodiment according to figure 1 is that a guide slot 7 may be dispensed with, linear guidance via a linear guide element 10 being possible if the guide bush 5 or the gas lever 6 are coupled to the guide element 10, for example via a connecting member 11. In this case, the guide element 10 runs approximately parallel to the spindle 2.

According to figure 3, an arrangement R_3 has a housing 1 in which, as described above, a spindle 2 is mounted in a rotatable manner. Arranged on the end of the spindle 2 is the drive disk 4, which can be rotated via the drive gear 8 of the regulating motor 9 having the displacement measuring system 3.2. The gas lever 6 sits with its guide bush 5 on the spindle 2, the guide bush 5 being in engagement with the spindle 2.

The connecting member 11 adjoins the guide bush 5 or the gas lever 6 and sits via a further guide bush (not designated here) on a spindle 2 which is designed as guide element 10 and on the end of which the displacement measuring system 3.1 is provided.

In this case, the guide element 10 is accordingly rotated during the linear movement of the gas lever 6, so that this rotary movement is determined in the displacement measuring system 3.1, 3.2 and an electrical signal is transmitted directly or indirectly to the engine. It is to be possible in this case within the scope of the present invention for the displacement measuring system 3.1 to be formed along the guide element

10, for example, as a magnetic strip element or the like in order to correspondingly transmit a signal to the engine or to the computer of the engine during the corresponding linear displacement or movement of the gas lever 6.

In the exemplary embodiment of the present invention according to figure 4, an arrangement R_4 is shown which essentially corresponds in construction to figure 3. A difference is that the regulating motor 9 operates a drive means 12 which is in engagement with the guide bush 5 of the gas lever 6 via the connecting member 11.

As a result, the gas lever 6, for example during operation by means of the autopilot, can be automatically controlled in accordance with the operating state of the engine. In this case, the drive means 12 may be a chain, a toothed belt or an element like that. There is no limit to the invention in this respect.

According to figure 5, an arrangement R_5 is shown in which, in a housing 1, the guide bush 5 is correspondingly guided linearly on the spindle 2 by means of the gas lever 6 in the manner described above. The force sensor 13, which is likewise connected to the control 14 (not shown), is assigned to the gas lever 6 and/or the guide bush 5.

Here, the regulating device 9, in particular the regulating motor, directly adjoins the spindle 2. If need be, a gear unit is superimposed, as indicated by broken line.

At the other end, the displacement measuring system 3.1 sits on the spindle 2 in the manner described above. Furthermore, the displacement measuring system 3.2, as described above, is likewise assigned to the regulating device 9. The gas lever 6 is linearly guided in the housing 1 in accordance with figure 1.

List of item numbers

- 1 Housing
- 2 Spindle
- 3 Displacement measuring system
- 4 Drive disk
- 5 Guide bush
- 6 Gas lever
- 7 Guide slot
- 8 Drive gear
- 9 Regulating device
- 10 Guide element
- 11 Connecting member
- 12 Drive means
- 13 Force sensor
- 14 Control

- R_1 Arrangement
- R_2 Arrangement
- R_3 Arrangement
- R_4 Arrangement
- R_5 Arrangement

- P Force

Patent claims

1. An arrangement for controlling an engine, in particular of an aircraft, having at least one gas lever (6) and a regulating device (9) for the additional automatic driving of the gas lever (6), characterized in that a movement of the gas lever (6) can be transmitted permanently, directly or indirectly, to a displacement measuring system (3.1, 3.2), the gas lever (6) is seated so as to be mounted in a linearly movable manner via a guide bush (5) of a rotatable spindle (2), the spindle (2) being designed as a non-self-locking trapezoidal screw spindle having a large pitch.
2. An arrangement for controlling an engine, in particular of an aircraft, having at least one gas lever (6) and a regulating device (9) for the additional automatic driving of the gas lever (6), characterized in that a linear, manual movement of the gas lever (6) can be transmitted mechanically to a displacement measuring system (3.1, 3.2).
3. An arrangement for controlling an engine, in particular of an aircraft, having at least one gas lever (6) and a regulating device (9) for the additional automatic driving of the gas lever (6), characterized in that a linear, mechanical and/or automatic movement of the gas lever (6) is coupled mechanically to the movement of a displacement measuring system (3.1, 3.2).
4. An arrangement for controlling an engine, in particular of an aircraft, having at least one gas lever (6) and a regulating device (9) for the additional automatic driving of the gas lever (6), characterized in that the regulating device (9) can be switched on in response to a signal of a force sensor (13) in order to assist a manual, linear movement of the gas lever (6).
5. The arrangement as claimed in claim 4, characterized in that the force sensor (13) is assigned to the gas lever (6) and/or the guide bush (5).
6. The arrangement as claimed in at least one of claims 1 to 5, characterized in that the spindle (2) is mounted so as to be rotatable in accordance with

the movement of the guide bush (5) by a linear movement of the gas lever (6).

AMENDED SHEET

7. The arrangement as claimed in one of claims 1 to 6, characterized in that the displacement measuring system (3.1) is arranged on one end of the spindle (2).

8. The arrangement as claimed in at least one of claims 1 to 7, characterized in that the regulating device (9), as regulating motor having, if need be, an associated displacement measuring system (3.2), acts directly or indirectly on the other end of the spindle (2).

9. The arrangement as claimed in at least one of claims 1 to 8, characterized in that a drive disk (4) is arranged on one end of the spindle (2).

10. The arrangement as claimed in claim 9, characterized in that the regulating motor (9) is connected to the drive disk (4).

11. The arrangement as claimed in at least one of claims 1 to 10, characterized in that the gas lever (6) is guided linearly in a guide slot (7) of the housing (1), this guide slot (7) being arranged approximately parallel to the spindle (2).

12. The arrangement as claimed in at least one of claims 1 to 11, characterized in that the gas lever (6) is connected directly or indirectly to a guide element (10) which runs approximately parallel to the spindle (2).

13. The arrangement as claimed in at least one of claims 1 to 12, characterized in that the displacement measuring system (3.1, 3.2), as a displacement transducer, is of an inductive, magnetic or optical type.

14. The arrangement as claimed in at least one of claims 1 to 13, characterized in that the displacement measuring system (3.1, 3.2) and/or the force sensor (13) and/or the regulating device (9) is connected to a control (14) in order to assist a manual movement of the gas lever (6) by connecting the regulating device (9) to load, it being possible for the respective positions of the gas lever (6) to be transmitted via the displacement measuring systems (3.1, 3.2) to the engine in accordance with the operating state.

1/2

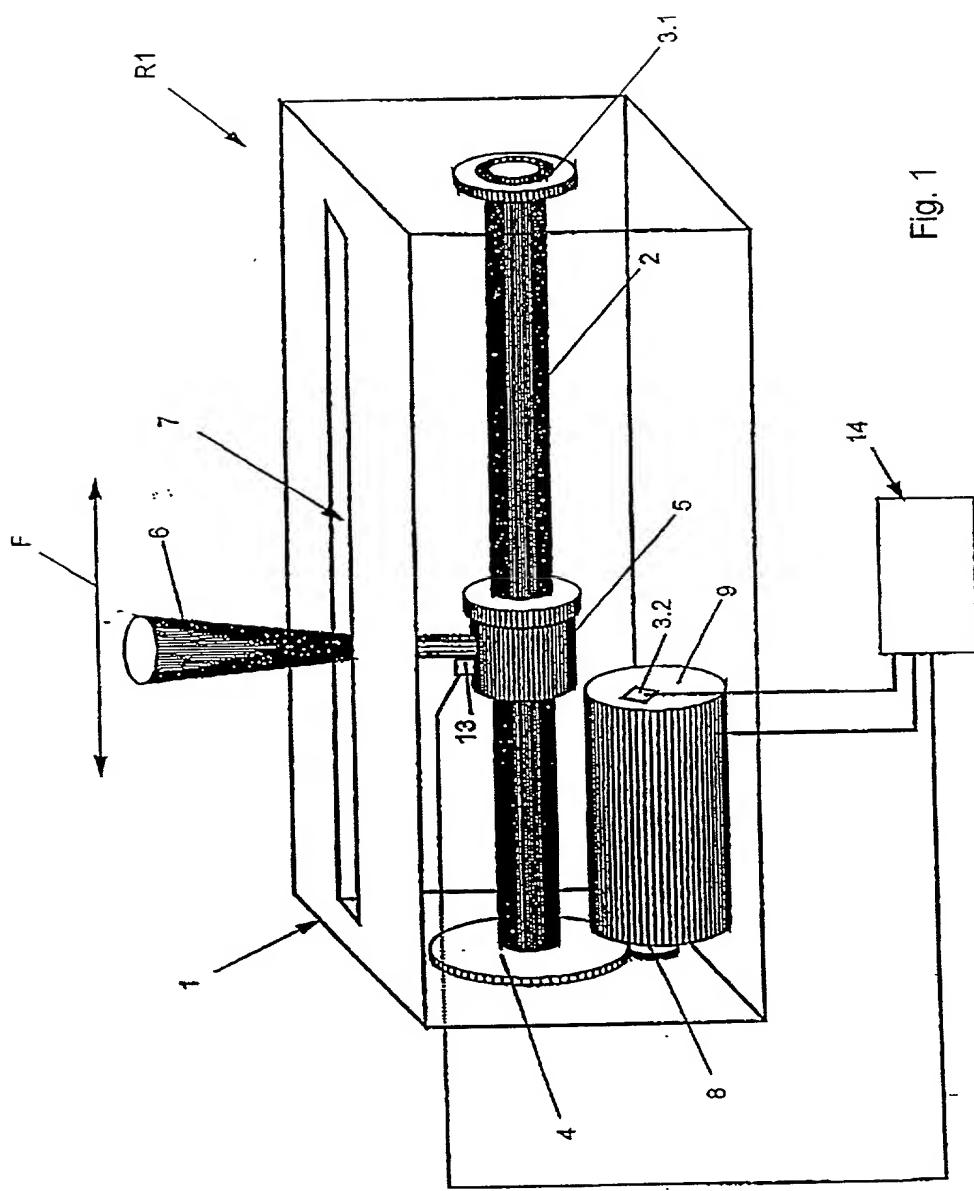


Fig. 1

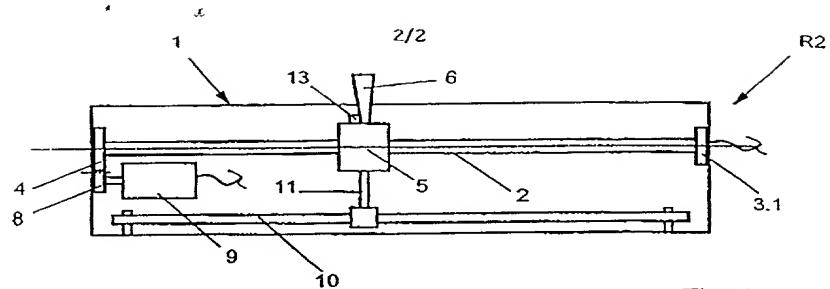


Fig. 2 R2

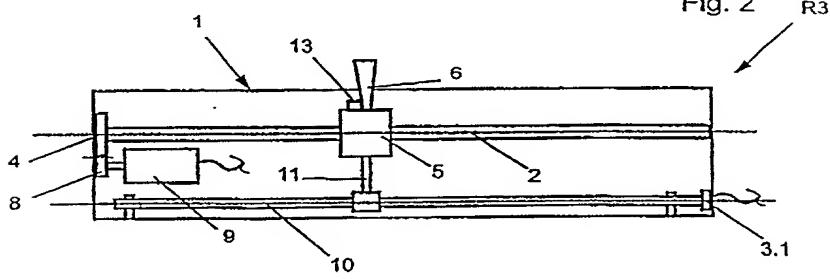


Fig. 3 R3

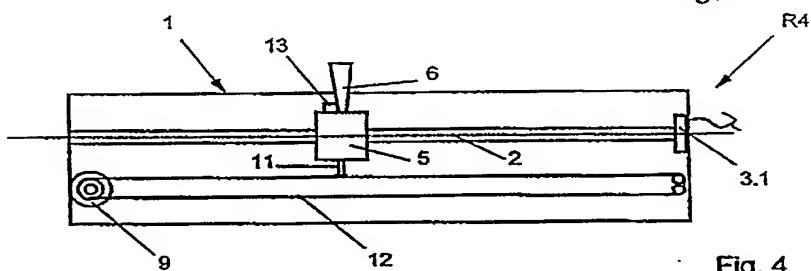


Fig. 4 R4

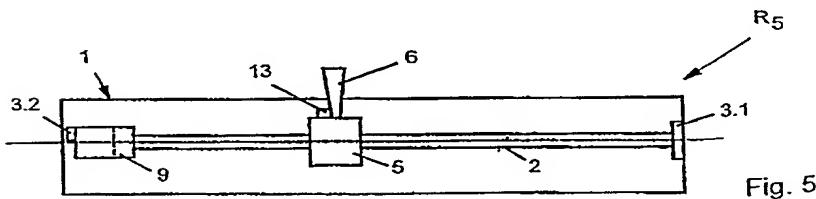


Fig. 5 R5

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

NOTE: Each inventor must be identified by full name, including the family name, and at least one given name without abbreviation together with any other given name or initial, and by his/her residence, post office address and country of citizenship. 37 CFR § 1.63(a)(3).

NOTE: Inventors may execute separate declarations/oaths provided each declaration/oath sets forth all the inventors. Section 1.63(a)(3) requires that a declaration/oath, inter alia, identify each inventor and prohibits the execution of separate declarations/oaths which each sets forth only the name of the executing Inventor. 62 Fed. Reg. 53,131, 53,142, October 10, 1997.

Full name of sole or first inventor

Jorg	(GIVEN NAME)	X	(MIDDLE INITIAL OR NAME)	Heinle	(FAMILY (OR LAST NAME))
Inventor's signature			OFC	Julie	
Date	14.11.2001	Country of Citizenship		GERMANY	
Residence	Stettinstrasse 1, 97990 Weikersheim, GERMANY DEX				
Post Office Address	SAME AS ABOVE				

Full name of second joint inventor, if any

(GIVEN NAME)	(MIDDLE INITIAL OR NAME)	(FAMILY (OR LAST NAME))
Inventor's signature		
Date	Country of Citizenship	
Residence		
Post Office Address		

Full name of third joint inventor, if any

(GIVEN NAME)	(MIDDLE INITIAL OR NAME)	(FAMILY (OR LAST NAME))
Inventor's signature		
Date	Country of Citizenship	
Residence		
Post Office Address		

(Declaration and Power of Attorney [1-1]—page 6 of 7)

*(check proper box(es) for any of the following added page(s)
that form a part of this declaration)*

Signature for fourth and subsequent joint inventors. Number of pages added _____

 * * *

**Signature by administrator(trix), executor(trix) or legal representative for de-
ceased or incapacitated inventor. Number of pages added** _____

 * * *

**Signature for inventor who refuses to sign or cannot be reached by person
authorized under 37 CFR 1.47. Number of pages added** _____

 * * *

**Added page for signature by one joint Inventor on behalf of deceased inventor(s)
where legal representative cannot be appointed in time. (37 CFR 1.47)**

 * * *

**Added pages to combined declaration and power of attorney for divisional,
continuation, or continuation-in-part (C-I-P) application.
□ Number of pages added** _____

 * * *

**Authorization of practitioner(s) to accept and follow instructions from representa-
tive.**

*(if no further pages form a part of this Declaration,
then end this Declaration with this page and check the following item)*

This declaration ends with this page.

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Robert H. Bachman, (19,374); Gregory P. LaPointe, (28,395);
Barry L. Kelmachter (29,999); and George A. Coury, (34,309)

(check the following item, if applicable)

- I hereby appoint the practitioner(s) associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.
- Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

NOTE: "Special care should be taken in continuation or divisional applications to ensure that any change of correspondence address in a prior application is reflected in the continuation or divisional application. For example, where a copy of the oath or declaration from the prior application is submitted for a continuation or divisional application filed under 37 CFR 1.53(b) and the copy of the oath or declaration from the prior application designates an old correspondence address, the Office may not recognize, in the continuation or divisional application, the change of correspondence address made during the prosecution of the prior application. Applicant is required to identify the change of correspondence address in the continuation or divisional application to ensure that communications from the Office are mailed to the current correspondence address. 37 CFR 1.53(d)(4). § 601.03, M.P.E.P., 7th Edition.

SEND CORRESPONDENCE TO

DIRECT TELEPHONE CALLS TO:
(Name and telephone number)

Address
BACHMAN & LAPOINTE, P.C.
900 Chapel Street, Suite 1201
New Haven, CT 06510-2802

George A. Coury
(203) 777-6628, Ext. 113

Customer Number _____

(complete the following if applicable)

Since this filing is a continuation divisional there is attached hereto a Change of Correspondence Address so that there will be no question as to where the PTO should direct all correspondence.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
GERMANY	199 26 8002	11.06.99	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER	FILING DATE
_____	_____
_____	_____
_____	_____

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)
UNDER 35 U.S.C. § 120**

The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART (C-I-P) APPLICATION.

(Declaration and Power of Attorney [1-1]—page 4 of 7)

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b), or (c))

(a) is attached hereto.

NOTE: "The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;

"(2) name of inventor(s), and attorney docket number which was on the specification as filed; or

"(3) name of inventor(s), and title which was on the specification as filed."

Notice of July 13, 1995 (1177 O.G. 60).

(b) was filed on _____, as Serial No. 0 / _____
or _____
and was amended on _____ (if applicable).

NOTE: Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 C.F.R. § 1.67.

NOTE: "The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

"(A) application number (consisting of the series code and the serial number, e.g., 08/123,456);

"(B) serial number and filing date;

"(C) attorney docket number which was on the specification as filed;

"(D) title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or

"(E) title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration."

M.P.E.P. § 601.01(a), 7th Ed.

(c) was described and claimed in PCT International Application No. PCT/EP00/05133, filed on 6/6/2000 and as amended under PCT Article 19 on _____ (if any).

(Declaration and Power of Attorney [1-1]—page 2 of 7)

SUPPLEMENTAL DECLARATION (37 C.F.R. § 1.67(b))*(complete the following where a supplemental declaration is being submitted)*

I hereby declare that the subject matter of the
 attached amendment
 amendment filed on _____

was part of my/our invention and was invented before the filing date of the original application, above-identified, for such invention.

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and
 in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 C.F.R. § 1.98.

PRIORITY CLAIM (35 U.S.C. §§ 119(a)-(d))

NOTE: "The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other situations, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i). If the certified copy is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate." 37 C.F.R. § 1.55(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §§ 119(a)-(d) of any foreign application(s) for patent or Inventor's certificate or of any PCT International application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or Inventor's certificate or any PCT International application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d) no such applications have been filed.
(e) such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

P2289/PCT-US

(Rev. 82-12/99 Pub. 605)

FORM 1-1

1-5

Practitioner's Docket No. 01-702**PATENT****COMBINED DECLARATION AND POWER OF ATTORNEY**(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,
CONTINUATION, OR C-I-P)

As a below named Inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

original.
 design.

NOTE: *With the exception of a supplemental oath or declaration submitted in a reissue, a supplemental oath or declaration is not treated as an amendment under 37 CFR 1.312 (Amendments after allowance). M.P.E.P. § 714.16, 7th Edition.*

supplemental.

NOTE: *If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.*

national stage of PCT.

NOTE: *If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.*

NOTE: *See 37 C.F.R. § 1.63(d) (continued prosecution application) for use of a prior nonprovisional application declaration in the continuation or divisional application being filed on behalf of the same or fewer of the Inventors named in the prior application.*

divisional.
 continuation.

NOTE: *Where an application discloses and claims subject matter not disclosed in the prior application, or a continuation or divisional application names an inventor not named in the prior application, a continuation-in-part application must be filed under 37 C.F.R. § 1.53(b) (application filing requirements — nonprovisional application).*

continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: *If the Inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.*

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint Inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the Invention entitled:

TITLE OF INVENTIONDEVICE FOR CONTROLLING AN ENGINE